

**SECTION 01 45 29**  
**TESTING LABORATORY SERVICES**

**PART 1 - GENERAL**

**1.1 DESCRIPTION:**

- A. This section specifies materials testing activities and inspection services required during project construction to be provided by a Testing Laboratory retained and paid for by the Contractor
1. Testing laboratory shall be approved by the VAMC.

**1.2 APPLICABLE PUBLICATIONS:**

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.
- B. Iowa SUDAS Standard Specifications.
- C. Iowa Department of Transportation (IDOT) Standard Specifications.
- D. American Society for Testing and Materials (ASTM):
- C31/C31M-06.....Making and Curing Concrete Test Specimens in the Field
  - C33-03.....Concrete Aggregates
  - C39/C39M-05.....Compressive Strength of Cylindrical Concrete Specimens
  - C109/C109M-05.....Compressive Strength of Hydraulic Cement Mortars
  - C138 (REV. A)-01..Unit Weight, Yield, and Air Content (Gravimetric) of Concrete
  - C140-07.....Sampling and Testing Concrete Masonry Units and Related Units
  - C143/C143M-05.....Slump of Hydraulic Cement Concrete
  - C172-04.....Sampling Freshly Mixed Concrete
  - C173-07.....Air Content of freshly Mixed Concrete by the Volumetric Method
  - C780-07.....Pre-construction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry
  - C1019-97.....Sampling and Testing Grout
  - C1064/C1064M-05...Freshly Mixed Portland Cement Concrete
  - C1077-06.....Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation
  - C1314-07.....Compressive Strength of Masonry Prisms
  - D698-07.....Laboratory Compaction Characteristics of Soil Using Standard Effort

D1556-00.....Density and Unit Weight of Soil in Place by the  
Sand-Cone Method

D1557-02.....Laboratory Compaction Characteristics of Soil  
Using Modified Effort

D2166-2000.....Unconfined Compressive Strength of Cohesive Soil

D2167-94(R2001)...Density and Unit Weight of Soil in Place by the  
Rubber Balloon Method

D2216-05.....Laboratory Determination of Water (Moisture)  
Content of Soil and Rock by Mass

D2922-05.....Density of soil and Soil-Aggregate in Place by  
Nuclear Methods (Shallow Depth)

D2974-07.....Moisture, Ash, and Organic Matter of Peat and  
Other Organic Soils

E329-07.....Agencies Engaged in Construction Inspection  
and/or Testing

E543-06.....Agencies Performing Non-Destructive Testing

### **1.3 REQUIREMENTS:**

- A. Accreditation Requirements: Testing Laboratory retained by Department of Veterans Affairs and paid for by Contractor, must be accredited by one or more of the National Voluntary Laboratory Accreditation Program (NVLAP) programs acceptable in the geographic region for the project. Furnish to the Resident Engineer a copy of the Certificate of Accreditation and Scope of Accreditation. For testing laboratories that have not yet obtained accreditation by a NVLAP program, submit an acknowledgement letter from one of the laboratory accreditation authorities indicating that the application for accreditation has been received and the accreditation process has started, and submit to the Resident Engineer for approval, certified statements, signed by an official of the testing laboratory attesting that the proposed laboratory, meets or conforms to the ASTM standards listed below as appropriate to the testing field.
1. Laboratories engaged in testing of construction materials shall meet the requirements of ASTM E329.
  2. Laboratories engaged in testing of concrete and concrete aggregates shall meet the requirements of ASTM C1077.
  3. Laboratories engaged in testing of soil and rock, as used in engineering design and construction, shall meet the requirements of ASTM D1557.
  4. Laboratories engaged in non-destructive testing (NDT) shall meet the requirements of ASTM E543.

5. Laboratories engaged in Hazardous Materials Testing shall meet the requirements of OSHA and EPA.
- B. Inspection and Testing: Testing laboratory shall inspect materials and workmanship and perform tests described herein and additional tests requested by Resident Engineer. When it appears materials furnished, or work performed by Contractor fail to meet construction contract requirements, Testing Laboratory shall direct attention of Resident Engineer to such failure.
- C. Written Reports: Testing laboratory shall submit test reports to Resident Engineer, Contractor, and Local Building Authority within 24 hours after each test is completed unless other arrangements are agreed to in writing by the Resident Engineer. Submit reports of tests that fail to meet construction contract requirements on colored paper.
- D. Verbal Reports: Give verbal notification to Resident Engineer immediately of any irregularity.
- E. Test Standards: The Contractor shall include a lump sum allowance of \$5000 for furnishing published standards (ASTM, AASHTO, ACI, ANSI, AWS, ASHRAE, UL, etc.) referred to or specifically referenced which are pertinent to any Sections of these specifications. Furnish one set of standards in single copies or bound volumes to the Resident Engineer within 60 days. Photocopies are not acceptable. Billings for the standards furnished shall be at the net cost to Testing Laboratory. A preliminary list of test standards, with the estimated costs, shall be submitted to the Resident Engineer for review before any publications of reference standards are ordered.

## **PART 2 - PRODUCTS (NOT USED)**

## **PART 3 - EXECUTION**

### **3.1 EARTHWORK:**

- A. General: The Testing Laboratory shall provide qualified personnel, materials, equipment, and transportation as required to perform the services identified/required herein, within the agreed to schedule and/or time frame. The work to be performed shall be as identified herein and shall include but not be limited to the following:
1. Observe fill and subgrades during proof-rolling to evaluate suitability of surface material to receive fill or base course. Provide recommendations to the Resident Engineer regarding suitability or unsuitability of areas where proof-rolling was observed. Where unsuitable results are observed, witness excavation of unsuitable material and recommend to Resident Engineer extent of removal and replacement of unsuitable materials and observe proof-rolling of replaced areas until satisfactory results are obtained.

2. Provide part time observation of fill placement and compaction and field density testing in building areas and provide part time observation of fill placement and compaction and field density testing in pavement areas to verify that earthwork compaction obtained is in accordance with contract documents.
3. Provide supervised geotechnical technician to inspect excavation, subsurface preparation, and backfill for structural fill.

**B. Testing Compaction:**

1. Determine maximum density and optimum moisture content for each type of fill, backfill and subgrade material used, in compliance with Iowa SUDAS Standard Specifications; Division 2 - Earthwork; Section 2010 - Earthwork, Subgrade and Sub base; Paragraph 3.09 - Field Quality Control and Division 3 - Trench Excavation and Backfill; Section 3010 - Trench Excavation and Backfill; Paragraph 3.06 - Trench Compaction Testing and in accordance with the "Compaction Requirements Table" shown on the plans.
2. Make field density tests in accordance with Iowa SUDAS Standard Specifications; Division 2 - Earthwork; Section 2010 - Earthwork, Subgrade and Sub base; Paragraph 3.09 - Field Quality Control and Division 3 - Trench Excavation and Backfill; Section 3010 - Trench Excavation and Backfill; Paragraph 3.06 - Trench Compaction Testing.
  - a. Curb, Gutter, and Sidewalk, test with Iowa SUDAS Standard Specifications; Division 2 - Earthwork; Section 2010 - Earthwork, Subgrade and Sub base; Paragraph 3.09 - Field Quality Control
  - b. Trenches, test with Iowa SUDAS Standard Specifications; Division 3 - Trench Excavation and Backfill; Section 3010 - Trench Excavation and Backfill; Paragraph 3.06 - Trench Compaction Testing.

- C. Testing Materials: Test suitability of on-site and off-site borrow as directed by Resident Engineer.

**3.2 SITE WORK CONCRETE:**

- A. Test site work concrete including materials for concrete as required in Article CONCRETE of this section.

**3.3 CONCRETE:**

- A. Test in accordance with Iowa SUDAS Standard Specifications; Division 7 - Streets and Related Work; Section 7010 - Portland Cement Concrete Pavement; Paragraph 3.08 - Quality Control and Section 7030 - Recreational Trails, Sidewalks and Driveways; Paragraph 3.11 - Testing.

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